

1 RECORD OF ORAL HEARING

2
3 UNITED STATES PATENT AND TRADEMARK OFFICE
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5
6 BEFORE THE BOARD OF PATENT APPEALS
7 AND INTERFERENCES
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10 Ex parte CHARILAOS CHRISTOPOULOS and
11 ATHANASIOS SKODRAS
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14 Appeal 2007-2758
15 Application 09/394,428
16 Technology Center 2600
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19 Oral Hearing Held: November 8, 2007
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23 Before HOWARD B. BLANKENSHIP, MAHSHID D. SAADAT, and
24 ROBERT E. NAPPI, Administrative Patent Judges
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26 ON BEHALF OF THE APPELLANTS:
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35 The above-entitled matter came on for hearing on Thursday,
36 November 8, 2007, commencing at 9:20 a.m., at The U.S. Patent and
37 Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Jan
38 Jablonsky, Notary Public.

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1 JUDGE BLANKENSHIP: Good morning, Mr. Lastova.

2 MR. LASTOVA: Good morning.

3 JUDGE BLANKENSHIP: Judge Saadat is under doctor's orders at
4home, so she's on speaker phone and she can hear everything you say.

5 MR. LASTOVA: Good morning, Judge Saadat.

6 JUDGE SAADAT: Good morning. How are you today?

7 MR. LASTOVA: I'm doing quite well. A little brisk outside. That
8gets us all going.

9 Today's hearing relates to discrete cosine transforms. And that's a
10pretty sophisticated technology, but just to give a very brief overview, it's a
11technique for expressing a wave form as a weighted sum of cosines, rather
12than as a weighted sum of sines and cosines as you would have in a discrete
13fourier transform.

14 It's used in image processing to separate an image into spectral
15sub-bands of differing importance. And an advantage of DCTs over DFTs is
16that you only need to perform real multiplications, rather than complex
17multiplications; which simplifies some of the calculations. But still, it's a
18pretty complicated and computationally intense procedure to calculate them.

19 So the inventors recognized that there were situations -- say, for
20example, a video conference -- in which there might be different people in
21the video conference that have different qualities of services, different
22bandwidths, different abilities to receive certain amounts of data. And what
23they recognized was there needed to be a way for that party to still be
24participating. And what they also realized was that, while it's all well and
25good to be able to have a whole bank of DCTs of different sizes to provide

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1these different qualities of services, that again that could be pretty
2complicated, expensive, and so forth to do that.

3 So what they wanted to figure out -- and they did figure out -- was
4how do you handle this situation, and you could only really use one size
5DCT? Okay? How can you essentially come up with and calculate a larger
6size DCT, when you only have a smaller size DCT? All right, so that's the
7problem.

8 And that is the very solution that the inventors were able to come up
9with. Now, they give a pretty good example of how you can take an
108-by-8-size DCT and then come up with a 16-by-16-size DCT. They give a
11pretty good explanation of that, in terms of math.

12 I'll start on page 5, which I won't even attempt to go through here,
13because it's pretty sophisticated stuff. And Figure 5 is a little bit better
14illustration of showing what has to be done, because it takes some pretty
15clever mathematics to be able to pull this off. It's not a straightforward thing
16to do. But they were able to pull it off, and it ended up actually giving them
17a very efficient way to do this; but not having to have, as I said, a whole
18bank of different sized DCTs.

19 So the examiner's rejection is primarily based on this Lee patent, the
20Lee 345 patent. Now, Lee is a different kind of patent.

21 JUDGE NAPPI: Excuse me, counsel. Before you get into that, I just
22have kind of a preliminary question about Lee.

23 MR. LASTOVA: Yes.

24 JUDGE NAPPI: Looking at the prosecution history of this case --

25 MR. LASTOVA: Okay.

26 JUDGE NAPPI: -- we had a final rejection that had a 103.

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1 MR. LASTOVA: Okay.

2 JUDGE NAPPI: You filed a brief. I'm asking you to just kind of go
3through it, because there's some question in my mind as to where things
4stand on this case procedurally. You filed a brief.

5 MR. LASTOVA: Yes, it's a very confusing file history, I have to say;
6partly, I think, because it got bounced back by the board here. I recall that
7the examiner had allowed some claims. So we have a first brief, right?

8 JUDGE NAPPI: Yes.

9 MR. LASTOVA: And that's a 103, right?

10 JUDGE NAPPI: Uh-huh.

11 MR. LASTOVA: We filed a brief arguing all the claims, essentially,
12right?

13 JUDGE NAPPI: Okay. We're dealing with the 103 in this case?

14 MR. LASTOVA: Well, actually, so then the examiner comes back,
15right, and makes what I believe was a 102, right, in the second, when he
16pulls back and allows some of the claims, right?

17 JUDGE NAPPI: And he just issues another non-final action?

18 MR. LASTOVA: He issues another non-final action. Now it's a 102.

19 JUDGE NAPPI: A 102 on Lee?

20 MR. LASTOVA: On Lee.

21 JUDGE NAPPI: That has to be briefed.

22 MR. LASTOVA: Right.

23 JUDGE NAPPI: And that's what you appealed.

24 MR. LASTOVA: Right.

25 JUDGE NAPPI: And then he gave you an examiner's answer
26addressing the 102.

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1 MR. LASTOVA: Right.

2 JUDGE NAPPI: And then it got remanded, or returned.

3 MR. LASTOVA: Returned. It got returned to try to reframe Claim
411, because somehow one of the amendments didn't get turned in.

5 JUDGE NAPPI: Uh-huh.

6 MR. LASTOVA: And when I was looking at the case today, the best
7I could tell, the examiner forgot he had allowed some of the claims, forgot
8she had made a 102, and just sort of copied and pasted and went back to
9another rejection. But I still think what's on appeal before us today is the
10claims that were rejected under 102 based on Lee, a subset of the claims that
11were not allowed. That's my understanding.

12 JUDGE NAPPI: Are there any communications with the examiner
13clarifying that?

14 MR. LASTOVA: Well, I mean, I had a lot of telephone calls with
15him. I mean, so all I have is that. And I have the interview summary record
16here, where he basically said to me, "It's a total mess. We have to figure out
17how to do this. The easiest thing to do is to just go ahead, make this
18amendment"; and then he actually asked me to fax the claims on appeal.
19And you can see the response advisory action after filing of the appeal brief,
20dated November 5, 2005, in which I put the claims on appeal -- which, of
21course, are the claims that we're discussing today, just the ones that are
22rejected.

23 JUDGE NAPPI: Claim 11 is the only issue?

24 MR. LASTOVA: Pardon me?

25 JUDGE NAPPI: Claim 11 is the only issue, as far as which is the
26proper version.

1 MR. LASTOVA: Proper version, that's right.

2 JUDGE NAPPI: Okay. So we're today considering the claims that
3are rejected under 102 based upon the non-final action?

4 MR. LASTOVA: Right. The primary rejection is the 102 claims, I
5think two, 11, 14, 16, 19. And there is a 103 that the examiner, I believe,
6has still maintained, of 22 and 23 and 24. Okay?

7 JUDGE NAPPI: I just wanted to make sure that we're all on the same
8page, so that there is some clarity in the record.

9 MR. LASTOVA: I agree with you, and I think, because of the
10passage of time between when everything happened and when everything
11got bounced back from the board a couple of times and got resolved, and we,
12I think, tried to resolve it via telephone, when I think memories had dimmed
13a little bit on where we were. But I think that's where we're at right now.

14 And if we're not there, I want to address whatever claims you think
15are on appeal or not on appeal or finally rejected. Because at the end of the
16day, the claims that are allowed, or were allowed -- and I didn't see the
17examiner withdraw the allowance of those, okay? -- are even more
18patentable, if you will, because they have additional features in the claims
19than the claims currently on appeal. So please let me know if I'm
20misunderstanding. I'm going to proceed on that basis. Is that acceptable?

21 JUDGE NAPPI: That was what I was thinking, also. But I just
22wanted to see if you had any other insight into it.

23 MR. LASTOVA: Right. Again, Examiner Senfi was very friendly on
24the phone and was trying to resolve all of this. Again, I think years have
25passed, and so I think that's where we were.

1 All right, back to Lee. Now, Lee, if you look at Figure 1 of Lee,
2which I think is the most helpful figure that we can start with in Lee, Lee's
3approach is actually -- It's a great approach, if you want to drive a Cadillac
4or a Mercedes Benz.

5 He has a 16-by-16-pixel block that comes from the left there, and as
6you can see, looking from the top down, he has a bank of DCTs. He has a
72-by-2 DCT, a 4-by-4 DCT, an 8-by-8 DCT, a 16-by-16 DCT. Basically,
8he's got the horsepower, if you will, to do any one of those that he decides is
9the best one for him to do. All right? So he's trying to actually figure out
10what's the optimal block size -- not DCT size, block size -- for me to get the
11optimal result that he wants to get.

12 And so he goes through a bunch of techniques here to figure out what
13that's going to be here. And I'm going to quote for you just very briefly from
14column seven, starting at line 30, how he describes his adaptive block size
15DCT technique, all right? And he says that that technique is implemented in
16the present invention and may be simply described as a compare-and-replace
17scheme. A 16-by-16-pixel data array, or block of the image, is coated as in
18the fixed-block-size DCT techniques. However, sub-block sizes of
1916-by-16, 8-by-8, 4-by-4, and 2-by-2 are used. Again, he says sub-block
20sizes; not DCT now, it's sub-block sizes.

21 He gives an example. For each 4-by-4 block, the number of bits to
22code the block by using four 2-by-2 sub-blocks inside the 4-by-4 block is
23examined. If the sum of the four 2-by-2 sub-blocks is smaller than the bits
24needed to code it as a 4-by-4 block, well, then the 4-by-4 block is replaced
25by the four 2-by-2 sub-blocks. Now, that's a mouthful. Okay?

1 But what the example is, is he's basically looking and saying, "Well,
2which one gives me the smaller number of bits that need to be coded?" That
3makes sense. And he's kind of figuring out, he says, "Well, okay, if I can do
4it with one 4-by-4, great. But if it's actually more optimal and fewer bits to
5do four 2-by-2's, well, I'll take that route and use it that way." So he's trying
6to figure out which one it is. And in each stage, he makes that decision
7about how he's going to go about doing that.

8 So the key that he's doing, he's trying to find, to use the language that
9the appeal claims, the optimal "N" size -- capital "N" -- trying to figure out,
10"What's the size that I want to use? Once I've figured out the size of the
11DCT that I'm going to actually use, then I'll go through that path, crank those
12through, and so forth." All right?

13 So he's essentially calculating a bank of "N"-sized DCTs, and he has
14to determine which one I want to use. All right? So you can see how
15computationally intensive it's going to be. You can see he's got 2-by-2s,
164-by-4s, 8-by-8s, and 16-by-16 DCTs that he's got to go through and work
17with.

18 Now, we only use one size DCT. All right? And I think that's the
19key. That's the reason why we're all here and it's important here today. I
20want to make sure there's no confusion, in the way the examiner got
21confused, between different sized pixel blocks or sub-blocks with different
22sized DCTs. And I want to make sure that I dispel this idea that I think the
23examiner tried to put into his answer where, "Well, if I can calculate a bunch
24of, let's say, 8-by-8 DCTs for a bunch of sub-blocks -- four of them, let's
25say -- and I later kind of just mix them up together, I kind of multiplex them

1all together at the end, I effectively have calculated a 16-by-16 DCT," and
2that's just not accurate. Okay?

3 The examiner hasn't shown how that could be done. I talked with the
4inventor on this issue. He says that's just poppycock, to use his words; it
5can't be done that way. The burden is on the examiner, first, to prove that it
6could be done that way.

7 So what you end up seeing, then, is that when you look at, say, for
8example, claim two, you see that claim two requires first processing circuitry
9for calculating a discrete fourier transform of length " N "/over-2 by
10" N "/over-2; " N " being the positive even, to produce four sequences of
11coefficients. Those, of course, would be " N "/over-2 DCT coefficients.
12Okay? Not " N " coefficients, but " N "/over-2 DCT coefficients.

13 Then the second processing circuitry calculates a DCT of length " N "
14by " N " directly from the four sequences of the coefficients that were
15produced using the " N "/over-2 by " N "/over-2 DCT. All right? So that's
16what has to be done.

17 In Lee, we see that just is not done. Figure 1 and Figure 2 both show
18that at all times we have separate paths and each DCT is the size of the DCT,
19and it stays that size all the way through. Okay?

20 JUDGE NAPPI: Can you walk me through in your spec where we
21have the first processing circuitry and the second processing circuitry
22perform these functions?

23 MR. LASTOVA: All right, let's see --

24 JUDGE NAPPI: I'm trying to figure out how to interpret this claim,
25and I want to understand what you mean by a processing circuitry.

1 MR. LASTOVA: Well, I mean, in terms of the figures, or in terms of
2a detailed description?

3 JUDGE NAPPI: Either one.

4 MR. LASTOVA: Well, I'll give that a go. I hadn't prepared that for
5the hearing today, but let me just take a quick look here and see if we can get
6that through.

7 Well, we've got the flow charts, particularly the flow chart in Figure 2,
8which give examples of the processing steps, other examples of processing
9steps, right?

10 JUDGE NAPPI: That shows the process?

11 MR. LASTOVA: Right, shows the process. Obviously, it could be
12implemented using the computer or some kind of computing circuitry.

13 JUDGE NAPPI: So you're saying the processing circuitry is a
14computer? That's the program?

15 MR. LASTOVA: Right. It could be a computer program, yes. Now,
16to be honest with you, Judge, you've probably read the specifications more
17recently than I have. So I'm not sure exactly what they say in terms of the
18exact processing circuitry.

19 JUDGE NAPPI: It wasn't jumping out at me. That's why I was
20asking.

21 MR. LASTOVA: Right. And if that's something that you want me to
22file a supplemental paper on, I think that would be the better course of
23action, for me to do that.

24 I think at this point in time, I can see that there are discussions of
25memories, as I'm flipping through the spec, and I'm looking at it right now;
26the steps for executing an algorithm. So it's going to be some kind of data

1processing circuitry that can execute an algorithm. And it's obviously stored
2using some sort of memory.

3 So I would say the best bet here now, without having read it recently,
4would be to suggest that it would be a program to a kind of computer, or
5perhaps some kind of program DSP that could perform these functions.

6 Would you like me to file a paper to follow up on this?

7 JUDGE NAPPI: No, I don't know if that will be necessary.

8 MR. LASTOVA: All right.

9 JUDGE NAPPI: We have you here, you know. The purpose of the
10hearings is to try to help us better understand the case.

11 MR. LASTOVA: Right.

12 JUDGE NAPPI: Are you familiar with the federal circuit's recent
13decision in Comiskey?

14 MR. LASTOVA: No, I'm not.

15 JUDGE NAPPI: It was a 101 issue.

16 MR. LASTOVA: Okay.

17 JUDGE NAPPI: And in looking at these claims, clearly, everything
18you've discussed so far today has been the algorithm --

19 MR. LASTOVA: Uh-huh.

20 JUDGE NAPPI: -- of transforming the discrete cosine transforms in
21various manners. Looking at claim two --

22 MR. LASTOVA: Uh-huh.

23 JUDGE NAPPI: -- or claim 11, which is the methods claim --

24 MR. LASTOVA: All right.

25 JUDGE NAPPI: -- what do you see that draws that claim to statutory
26subject matter?

1 MR. LASTOVA: Fair question. Let's look at claim two. Claim two
2is an encoder or decoder. In the context of the specification, we understand
3that's encoding or decoding for purposes of image processing. And so I'm
4going to fall back on saying, well, that's structure.

5 JUDGE NAPPI: No, it's the question of what a circuit is. That was
6where that question was coming from.

7 MR. LASTOVA: Uh-huh.

8 JUDGE NAPPI: What is the structure?

9 MR. LASTOVA: Right. So again, if it was a program computer, all
10right, for implementing the algorithm, the point is, it's still going to be
11encoding and decoding raw data, image data, for purposes of transmission.

12 JUDGE NAPPI: There's no transmission in that claim.

13 MR. LASTOVA: Right. But the point is an encoder or decoder
14would be understood as a device that's used in the context of transmitting, or
15a decoder receiving. We do have figures here. You see the conference call
16right there that's shown in Figure 1. You certainly have that. So there is a
17practical application.

18 JUDGE NAPPI: Yes. It would have to be a claimed practical
19application, is my understanding.

20 MR. LASTOVA: Right. So, well, I mean, I think the point here is
21you're asking about -- I'm saying the claim recites an encoder or decoder.

22 JUDGE NAPPI: Okay.

23 MR. LASTOVA: And so the encoder or the decoder certainly has to
24be understood as a device that is used in a useful context. All right? And
25the encoder or decoder is then going to use this circuitry inside the circuitry
26to accomplish that useful result.

1 Claim 11, if you read the beginning of that, says, "A method of
2encoding a digitalized image." So in other words, it's a method for using an
3encoder and so forth. Claim 19 relates to transcoding an image; claim 16, a
4method of decoding the image. So certainly, the application of this is quite
5practical. The structure, encoder or decoder, that's a relatively well known
6structure.

7 And since that's not a rejection on appeal, I would say, just looking at
8the claims, they seem statutory, at first blush, to me; given the fact that they
9are useful, they do recite structure, the structure is in the context of an
10application that is practical, of tangible applications. And the fact is that we
11can understand that computers, of course, digital program computers, DSPs
12that are programmed, I think those devices have been long claimed, as you
13all well know, and found to be statutory subject matter as well. So I guess
14we could come at this from a couple of different angles. But each angle that
15I'm looking at suggests that the claims are statutory.

16 JUDGE SAADAT: I have a comment, counsel. The way you
17describe this, these processing circuitries are nominal generic processes; or
18at least, related components. If that is the case, what distinguishes them over
19any type of processor that does sub-calculations?

20 MR. LASTOVA: Okay.

21 JUDGE SAADAT: I mean, if you put the emphasis on the generic
22processing circuitry, all those calculations just become regular sub kind of
23calculations. And if you put the emphasis on the process of calculating, then
24it becomes like sub-serve percentage.

25 MR. LASTOVA: Well, again, I mean, I was responding to Judge
26Nappi's comment with respect to the 101-type rejection. Obviously, I'm not

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1discounting that the circuitry has been configured in a particular way. I'm
2not suggesting we've invented an electronic circuit in the sense that we were
3the first time to ever come up with a DSP or program computer. The
4question is, how is the circuitry configured to perform certain functions as
5we've recited specifically here?

6 So that's my response to that, Judge Saadat. So I think that you have
7to read the claim in its full context. We're not just saying we claim an
8encoder with a first processing circuit and a second processing circuit.
9We've claimed an encoder or decoder that has that circuitry, and that
10circuitry is configured to perform very specific operations that transform
11data from one particular state to another state and, as I said, gives a useful
12result, which is the result that we can now calculate different size DCTs
13when we only have one DCT available. Does that answer your question?

14 JUDGE SAADAT: It does. That's the dilemma it creates. If we
15determine that these are statutory just because there is some encoding or
16decoding or processing circuitry involved, then what is specific about this
17processing circuitry? It either would make it statutory and probably just
18generic circuitry for doing sub-calculations, correct?

19 MR. LASTOVA: Well, okay, now the sum -- I think I kind of heard
20you say for some calculations. We're not claiming a generic device, in the
21sense that the device actually has to perform very specific calculations,
22right? It has to be able to calculate a DCT that's only got a certain length -- a
232-by-2, for example, all right? -- to produce four sequences of coefficients
24that relate to "N"-over-2 type DCT operations. That's one processing
25function that has to be performed.

1 And another one that has to be performed is to be able to calculate a
2DCT of length "N"-by-"N" correctly from these four sequences of
3coefficients. So I think we can't just look at one on one and say, "Well, you
4just claim the computer here; you just claim a generic circuit." I think that
5what we've invented here is an encoder or a decoder, looking at claim two,
6that can be used in the context of image processing to be able to provide to a
7transmitter that has to transmit this data in a compressed format using just
8one DCT size.

9 And I think that's really what's novel and useful -- frankly, quite
10useful -- particularly as I started off the hearing describing a video
11conference in which different people had different qualities of services and
12couldn't necessarily always handle the bandwidth that would be required for,
13say, for example, a 16-by-16 DCT type bandwidth.

14 So I think if we just focus on one thing, or one word, or one drawing,
15we lose the context of the overall application.

16 JUDGE SAADAT: So you are suggesting that the processing
17circuitry includes different components that have to produce these two
18sequences and then that are obtained from the length of "N"-over-2; and that
19another circuitry must store them and then process them to calculate the
20complete length "N"?

21 MR. LASTOVA: Yes. I mean, the circuitry has to be configured to
22do that.

23 JUDGE SAADAT: That's what Judge Nappi was asking the first
24time. We don't see a particular processing circuitry disclosed.

25 MR. LASTOVA: Right. And as I was trying to respond earlier to
26that, I think what we do see is we see function block diagrams. We see a

1flow chart. We see flow charts in the figures. We see a discussion. And
2again, I haven't really looked at this particular issue in preparation for this
3appeal. But we certain can see that there is envisioned some kind of data
4processing circuitry and some kind of memory that would permit the
5computations to be performed as we've claimed them.

6 And I don't want to say here on the record, "Well, it has to be a DSP,
7or it has to be a program computer." Either one of those could be fine. It
8could potentially be implemented in an ASIC chip, which maybe in fact is
9the way they actually do it. So there are different ways that the circuitry
10could be implemented to implement these specific functions. So that's one
11thing I want to make sure is clear on the record.

12 JUDGE NAPPI: Well, what I'm also hearing you say is it's not
13actually two physical circuits. This is one chip that's performing both of
14these functions.

15 MR. LASTOVA: It could be one chip performing both functions, or
16it could be two separate chips that are working cooperatively.

17 JUDGE SAADAT: Okay.

18 MR. LASTOVA: All right. So I guess we've spent some time on sort
19of 101 issues. And I just want to get back to my main point, which is that I
20think that with the claims on appeal, if we look at 102 and we look at the
21features of the claims, we can see that they're directed to two different kinds
22of technologies in the sense that you have a Lee which says, "I'm going to
23provide all size DCTs, I'm going to let every DCT there, I've got an
24unlimited budget and I'm going to be able to provide all kinds of DCT type
25transforms, and I'm going to figure out which is the optimal one based on the
26block size"; and we've got our invention here which says, "Well, we don't

1have that much liberty and we don't have that big of a bank account, so we
2want to be able to just use one DCT to be able to provide not only that size
3DCT operation, but we can also then generate a larger size DCT calculation
4as well and come up with those coefficients as well to provide, effectively
5simplement, a larger size 'N', if you will, DCT operation using an
6'N'-over-2-size DCT."

7 So the anticipation rejection, I believe, is simply wrong, because it
8doesn't teach the features required by the claims. And the examiner also
9applies a Tzou reference, which I don't think remedies the deficiencies of
10Lee with respect to the main things that we've been talking about here today
11and that are outlined in the brief and the reply.

12 Do you have any other questions?

13 JUDGE SAADAT: I don't have any more.

14 JUDGE NAPPI: I don't have any more.

15 MR. LASTOVA: All right. Thank you for your attention today.

16 JUDGE BLANKENSHIP: Thank you.

17 (Whereupon, at 9:45 a.m., the hearing was concluded.)